

DRAFT

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*A Process for Evaluating Pesticides in  
Washington State Surface Waters for Potential  
Impacts to Salmonids*

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By:

Washington State Department of Agriculture  
Washington State Department of Natural Resources  
Washington State Department of Fish & Wildlife  
Washington State Department of Ecology  
U.S. Fish & Wildlife Service - Western Washington Office  
National Marine Fisheries Service - Northwest Region  
U.S. Environmental Protection Agency - Region 10

*Through:*

*Washington State Pesticide/ESA Task Force*

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## Acronyms and Symbols

§	Section
AFW	Agriculture, Fish and Water
ALC	Aquatic Life Criteria
BMP	Best Management Practice
CFR	Code of Federal Regulations
CWA	Clean Water Act
DPS	Distinct Population Segment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	Federal Register
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
GIS	Geographic Information System
HCP	Habitat Conservation Plan
IPM	Integrated Pest Management
LC <sub>50</sub>	Lethal Concentration that results in the mortality of 50% of the population
MCPB	Methyl Chlorophenoxy Butyric Acid
NAWQA	National Water Quality Assessment
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OPP	Office of Pesticide Programs (EPA)
PSWQA	Puget Sound Water Quality Authority
QA/QC	Quality Assurance/Quality Control
RCW	Revised Code of Washington
SSHIAP	Salmon and Steelhead Habitat Inventory and Assessment Program
T/E	Threatened or Endangered
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WQP	Water Quality Program
WRIA	Watershed Resource Inventory Assessment
WSDA	Washington State Department of Agriculture
WSU	Washington State University

## I. Executive Summary

Several species of salmon, trout and char in Washington State have recently been listed for protection under the Endangered Species Act (ESA). The deterioration or loss of freshwater and estuarine habitat has been a major contributing factor in the decline of these wild salmonids. Among the various factors that contribute to water quality, there is a growing concern that current use pesticides could potentially pose an obstacle to the conservation and recovery of T/E salmonids. However, in general, the effects of pesticides on salmonid health, salmonid populations and aquatic ecosystems in the Pacific Northwest are not well understood.

An interagency Task Force was convened in March of 2000 to address the considerable scientific uncertainty surrounding pesticides and salmonids. The Task Force is a collaborative effort between the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the Environmental Protection Agency – Region 10, and Washington State Departments of Agriculture, Ecology, Fish and Wildlife, and Natural Resources. The U.S. Geological Survey and Washington State University have also contributed to this effort in an advisory capacity. The principal mission of the Task Force is to provide science-based guidance to natural resource and regulatory agencies on the potential exposure to and toxicity of pesticides to salmonid or aquatic ecosystems.

The initial aim of the Task Force was to develop an evaluation process that incorporates the available scientific data on 1) the occurrence of pesticides in salmonid habitat, and 2) the toxicity of these chemicals to fish or the aquatic food chain. The Task Force's screening process, or decision matrix, will be used to identify individual pesticides that are (and are not) a potential risk to the biological requirements of T/E salmonids in Washington State.

This White Paper provides a brief background on the ESA and the geographical distribution of threatened and endangered salmonids in Washington State. In addition, it provides an introduction to current use pesticides, the State's Agriculture, Fish, and Water process, and the history and mission of the Washington State Pesticide/ESA Task Force.

The White Paper describes the Task Force's pesticide evaluation process. This is a process document only - i.e., the Task Force has yet to actually screen the approximately 750 pesticide active ingredients that are currently registered for distribution in Washington State. Currently, the decision matrix does not contain a complete description of the decision criteria that will be used to evaluate individual chemicals. The Task Force intends to provide the scientific basis for each decision criteria in an expanded technical document. This White Paper contains:

- ◆ A description of the pesticide decision matrix and a general introduction to the criteria that will be used to evaluate individual pesticide active ingredients at different steps in the process
- ◆ Descriptions of the different categories in the matrix, and the Task Force's recommendations for pesticides that fall into each category
- ◆ Specific examples to show how the screening process will work for different chemicals
- ◆ Major sources of scientific uncertainty

Additionally, the Task Force has identified additional steps that will substantially improve the quality, quantity and management of data for the evaluation process. These include:

- ◆ A new USGS monitoring effort to detect pesticides in Washington State surface waters that focuses on habitat for T/E salmonids, and will include sub-basins that have different land use characteristics (e.g., urban and agricultural).
- ◆ The establishment of a GIS-based database that can be used to estimate pesticide exposures for T/E salmonids at more precise spatial and temporal scales.

The Task Force recommends using the pesticide screening process as part of a larger adaptive management program that will incorporate new scientific data as they become available. Moreover, if best management practices, use restrictions or other mitigation measures are enacted to reduce or eliminate the transport of pesticides to salmonid habitat, an integrated surface water-monitoring component would provide the necessary data to determine if such practices are effective or would require further modification.

## II. Background

In December 1999, the National Marine Fisheries Service (NMFS) published “*The ESA Proposed 4(d) Rules for Pacific Salmon*” (NOAA, 2000a). These draft rules were released concurrent with the State of Washington’s Agriculture, Fish and Water (AFW) negotiations. AFW is a formal collaborative process, established by the Washington State Governor’s Salmon Recovery Strategy, to develop conservation standards for farmers which provide resource protection necessary for recovery of salmon and bull trout listed under the Endangered Species Act (ESA). AFW involves members from the agricultural community, the Governor’s Office, the Washington State Departments of Agriculture (WSDA), Ecology (WDOE), Fish and Wildlife (WDFW) and the Conservation Commission; federal representatives from the U.S. Environmental Protection Agency (EPA Region 10), NMFS, U.S Fish and Wildlife Service (USFWS), Natural Resources Conservation Service, U.S. Department of Agriculture’s Farm Service Agency and the Bureau of Reclamation; as well as tribal, local government and environmental community representatives.

Prior to the publication of “*The ESA Proposed 4(d) Rules for Pacific Salmon*” the assumption by most individuals was that a pesticide applied according to the EPA-registered label directions would not harm listed species, and thus intrinsically provides coverage for the pesticide applicator under the ESA. After the publication of the proposed rules, it became clear that this was not necessarily the case. As a result, pesticide users became extremely concerned that they could be in violation of the ESA via the otherwise-lawful use of pesticides under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA). Additionally, the agricultural caucus involved in the AFW negotiations insisted that WSDA address the pesticide issue relative to ESA.

After discussions with state and federal agencies, NMFS clarified its position on ‘take’ by pesticides in the responsiveness summary to “*Endangered and threatened species: Final rule governing take of 14 threatened salmon and steelhead evolutionarily significant units*” (NOAA, 2000b). The NMFS clarification stated that it would continue to conduct research into the effects of pesticides on salmonids to resolve the uncertainty in this area. NMFS also stated that it would address pesticide issues through the ESA Section (§) 7 consultation process or discussions with responsible state authorities; and that it preferred this approach rather than using its enforcement authorities against individual applicators for the otherwise-lawful use of pesticides. The Washington State Pesticide/ESA Task Force (described below) grew out of this commitment to work with the appropriate state and federal agencies to address pesticide issues relative to T/E salmonids.

## A. ESA Overview: Threatened and Endangered Salmonids in Washington State

Washington's rivers, tributaries, and estuaries provide habitat for several species of salmon, steelhead, and trout. Some species exhibit anadromy, meaning they migrate as juveniles from freshwater to the ocean, and then return as adults to spawn in freshwater. Others reside for most or all of their life in freshwater. Among the anadromous species are the Pacific salmon, including chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye (*O. nerka*), chum (*O. keta*) and pink salmon (*O. gorbuscha*). Steelhead (*O. mykiss*), coastal cutthroat trout (*O. clarki clarki*), and bull trout (*Salvelinus confluentus*) differ from Pacific salmon in that they are iteroparous, which means they are capable of spawning more than once before they die. These species can also exhibit anadromy; however, cutthroat and bull trout generally spend more or all of their life in fresh water. For the purposes of this document, fish species listed under the ESA of 1973, as amended, as threatened or endangered (T/E) include salmon, steelhead trout, bull trout and coastal cutthroat trout (all in the Salmonidae family and are hereafter referred to as T/E salmonids).

Many salmonid populations are in decline throughout Washington State. This has prompted federal protection for these species under the provisions of the ESA. Two federal agencies oversee the recovery of T/E salmonids. NMFS has jurisdiction over anadromous salmonids that spend the majority of their life in the ocean, including Pacific salmon and steelhead. USFWS has jurisdiction over primarily freshwater species, including bull trout and coastal cutthroat trout.

The ESA defines the term *endangered species* as "any species, which is in danger of extinction throughout all or a significant portion of its range". The term *threatened species* is defined as "any species, which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range". As amended in 1978, the ESA allows the listing of "distinct population segments" (DPSs) of vertebrates as well as named species and subspecies. In the case of Pacific salmon and steelhead, NMFS considers a population (or group of populations) as "distinct" for purposes of the ESA if it represents an evolutionarily significant unit (ESU) of the species. An ESU is defined as a population that 1) is substantially reproductively isolated from conspecific populations, and 2) represents an important component of the evolutionary legacy of the species (NOAA, 1991).

Two salmon runs are currently listed as endangered in Washington State. These are the steelhead and spring-run chinook populations in the Upper Columbia River ESU. In addition, several chinook, sockeye, chum, steelhead ESUs, and bull trout DPSs have been listed as threatened in various river basins and estuaries throughout the state. Finally, coho salmon and coastal cutthroat trout in the Southwest Washington/Lower Columbia River ESU and DPS, respectively are currently candidate species, and are proposed for listing as threatened in the near future. Figure 1 depicts watersheds that provide habitat for one or more T/E species of salmonids.

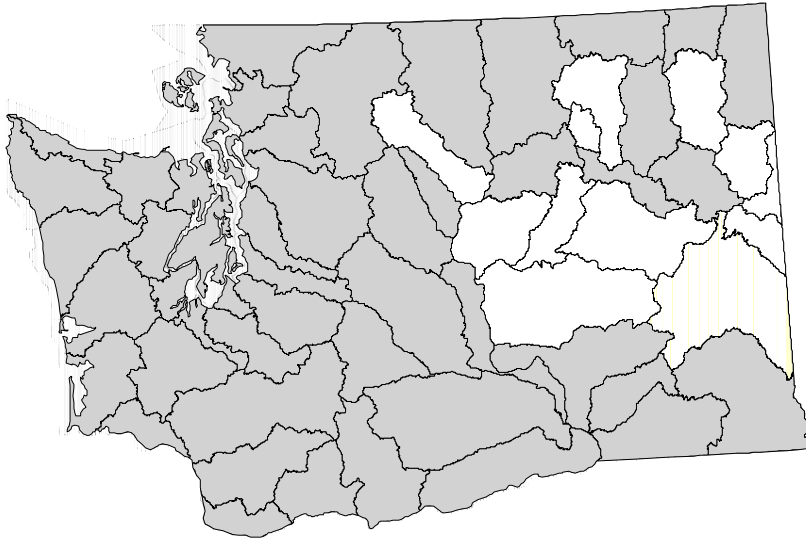


Figure 1. Map of Federally Listed and Proposed Fish Areas by Watershed Resource Inventory Area (WRIA) Units in Washington State. (Shaded units are those that provide habitat for one or more proposed, threatened or endangered salmonid species.)

## B. Pesticides as a Potentially Limiting Factor for Salmonid Recovery

Several factors have contributed to the decline of salmonid populations in Washington State. These include over harvest, past and ongoing destruction of freshwater and estuarine habitats, hydropower operations, hatchery practices, and other causes (NMFS, 1996; 1998). In the context of habitat, salmonids need cold clean water in adequate quantity to spawn and survive rearing and migration periods. Degraded water quality places significant limits on the conservation and recovery of T/E salmonids (NMFS, 1996; 1998).

Section 9(a)(1) of the ESA prohibits "take", which is defined as activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct [ESA §3(18)]. Take may result from direct, indirect or cumulative actions. Moreover, the Services (USFWS & NMFS) define the term harm to include any act that actually kills or injures wildlife. In the case of salmonids, such acts may include significant habitat modification or degradation that significantly impairs the essential behavioral patterns of an animal [50 CFR §17.3] (NOAA 1999). Essential behavioral patterns include (but are not limited to) spawning, rearing, migrating, feeding, or sheltering.

As previously stated, a final ESA 4(d) rule governing the take of several listed salmonids was recently issued by NMFS (NOAA, 2000b). The rule adopts regulations necessary and advisable to conserve threatened salmonid ESUs, and it applies to several listed populations in Washington State. The final ESA 4(d) rule governing take acknowledges that some pesticides may kill or injure salmonids by impairing essential behavioral patterns (NOAA, 2000b).

Pesticides have been detected in river systems that provide habitat for T/E salmonids throughout the state. For example, past and ongoing National Water Quality Assessment (NAWQA) surface water monitoring studies in the Puget Sound basin (Bortleson and Davis, 1997), the Yakima basin (Rinella et al., 1999), and the Central Columbia Plateau (Williamson et al., 1998) have detected diverse mixtures of pesticides in rivers and streams that support listed species. While some of these pesticides are so-called legacy or persistent pesticides that were widely used in the past but have since been banned (e.g. DDT), the majority of surface water detections reflect pesticides that are currently in use. Since the basins included in the aforementioned NAWQA studies overlap with the WRIAs providing habitat for T/E salmonids (Figure 1), all future references to surface water detections of pesticides in this document will be assumed to occur in salmonid habitat.

Current use pesticides are a large group of substances that are specifically designed to repel, kill, or regulate the growth of undesirable biological organisms. This diverse group includes fungicides, herbicides, insecticides, nematicides, molluscicides, rodenticides, fumigants, disinfectants, repellents, wood preservatives, and antifoulants. The most commonly used pesticides are insecticides, herbicides, and fungicides. These are used for pest control in areas such as forested lands, agricultural crops, tree farms and nurseries, highways and utility rights of way, parks and golf courses, as well as for residential purposes (PSWQA, 1990).

## **C. The Washington State Pesticide/ESA Task Force**

In response to the pesticide issue identified during the AFW negotiations, the Washington State Pesticide/ESA Task Force (hereafter referred to as the Task Force) was established. The Task Force is an interagency technical and policy team composed of scientists and managers from resource and regulatory agencies and includes: NMFS-Northwest Region, USFWS-Western Washington Office, U.S. EPA-Region 10, WDOE, WDFW, Washington State Department of Natural Resources (WDNR) and WSDA. Scientists from the U.S. Geological Survey (USGS) and Washington State University (WSU) contribute to the Task Force in an advisory capacity.

The mission of the Task Force is to determine which pesticide uses may cause harm or are potentially limiting the recovery of listed salmonids in the wild; and to recommend to regulatory agencies management actions to reduce and/or eliminate exposure to and therefore risk from those pesticides. While identifying pesticides that may impact salmonid recovery, the Task Force will also identify pesticides that do not pose a risk to salmonids. In identifying those pesticides

which may have an impact on T/E salmonids, the Task Force will also work to protect the status of healthy salmonid stocks as well as other fish populations by reducing the transport of pesticides to aquatic habitats.

The process developed by the Task Force for determining if pesticides are limiting recovery of T/E salmonids is a logical step-wise approach. The initial stages of this process include evaluation of surface water only. Over time however, all potential pesticide exposure pathways (i.e., ground water intrusion, sediment, and dietary) will be identified and evaluated. In this manner a thorough evaluation of all routes of pesticide exposure will be incorporated into the screening process.

As an example of how this process will work, the Task Force will first identify pesticides that are detected in surface waters using all available pesticide data. If a pesticide has not been measured, or is not routinely measured, the Task Force will determine whether it should be measured in the future. The next step will be to establish whether the pesticide was detected in salmonid habitat evaluating both urban and agricultural basins using the Salmon and Steelhead Habitat Inventory Assessment Program (SSHIAP) database. In addition to habitat locations this database will also provide salmonid presence information on a monthly basis to allow determinations to be made regarding specific life stage exposure. Once exposure of salmonids has been established, the Task Force will evaluate the available information to determine if the pesticide is inhibiting the biological requirements of T/E salmonids and thus, a contributing factor limiting the recovery of the species. Where scientific data are lacking, the Task Force will recommend new surface water monitoring or toxicological research as appropriate. As new data become available, they will be incorporated into the pesticide screening process as part of a larger adaptive management program.

In this document, the Task Force describes the process that will be used to screen the available information and identify which pesticides do or do not pose a risk for salmonids. The goal of the process is to quickly remove pesticides from consideration that do not pose a risk to salmonids in order to focus on the pesticides which might adversely impact the ability of these fish species to recover in the wild.

### III. Pesticide Decision Matrix

#### A. Introduction

As stated, the goal of the Task Force is to review and synthesize the available information on pesticides in Washington State as they pertain to salmonid exposure; and to evaluate the potential for adverse impacts on the biological requirements of T/E listed salmonid species. A key element of this effort was the development of an evaluation process, or a decision matrix, to incorporate the relevant scientific data. The matrix could then be used to identify which pesticides are (and are not) likely to pose a risk for salmonids. The matrix could also be used to identify important information gaps or areas of scientific uncertainty.

This section describes the Task Force's decision matrix for current use pesticides. The process begins with a complete list of approximately 750 pesticide active ingredients that are registered for distribution in the state. The matrix incorporates several broad categories of information, each as a decision point in the pesticide evaluation process. These include:

- ◆ The patterns and amounts of pesticide application in basins having different land use characteristics;
- ◆ The evidence for pesticide transport and delivery to salmonid-bearing river systems and estuaries;
- ◆ The distribution of listed species in these surface waters, and the evidence for exposure at different life history stages;
- ◆ The evidence that pesticides may reduce the food available to listed species or impair their essential behavioral patterns.

This initial version of the decision matrix considers each pesticide individually and uses surface water detections as a direct estimate of a chemical's entry into the aquatic ecosystem. The Task Force is aware that other routes of exposure (e.g., ground water intrusion, sediment, dietary) may also be important for salmonids. Moreover, the decision matrix does not explicitly consider the issues of product formulation, exposures to mixtures, or environmental variables that may alter the relative toxicity of a pesticide (see 'uncertainties' in Section V below). Although these complex factors may contribute to the overall toxicity of a pesticide in salmonid habitat, they are beyond the scope of this initial process document.

The decision matrix uses aquatic life criteria, where available, to determine whether a pesticide will adversely impact the aquatic food chain. It is important to note that only a few pesticides have such criteria. Also, existing criteria are not based on the biological requirements of threatened and endangered salmonids, and therefore may not be protective of a listed species' essential behavioral patterns. The use of aquatic life criteria (or standards) will therefore be

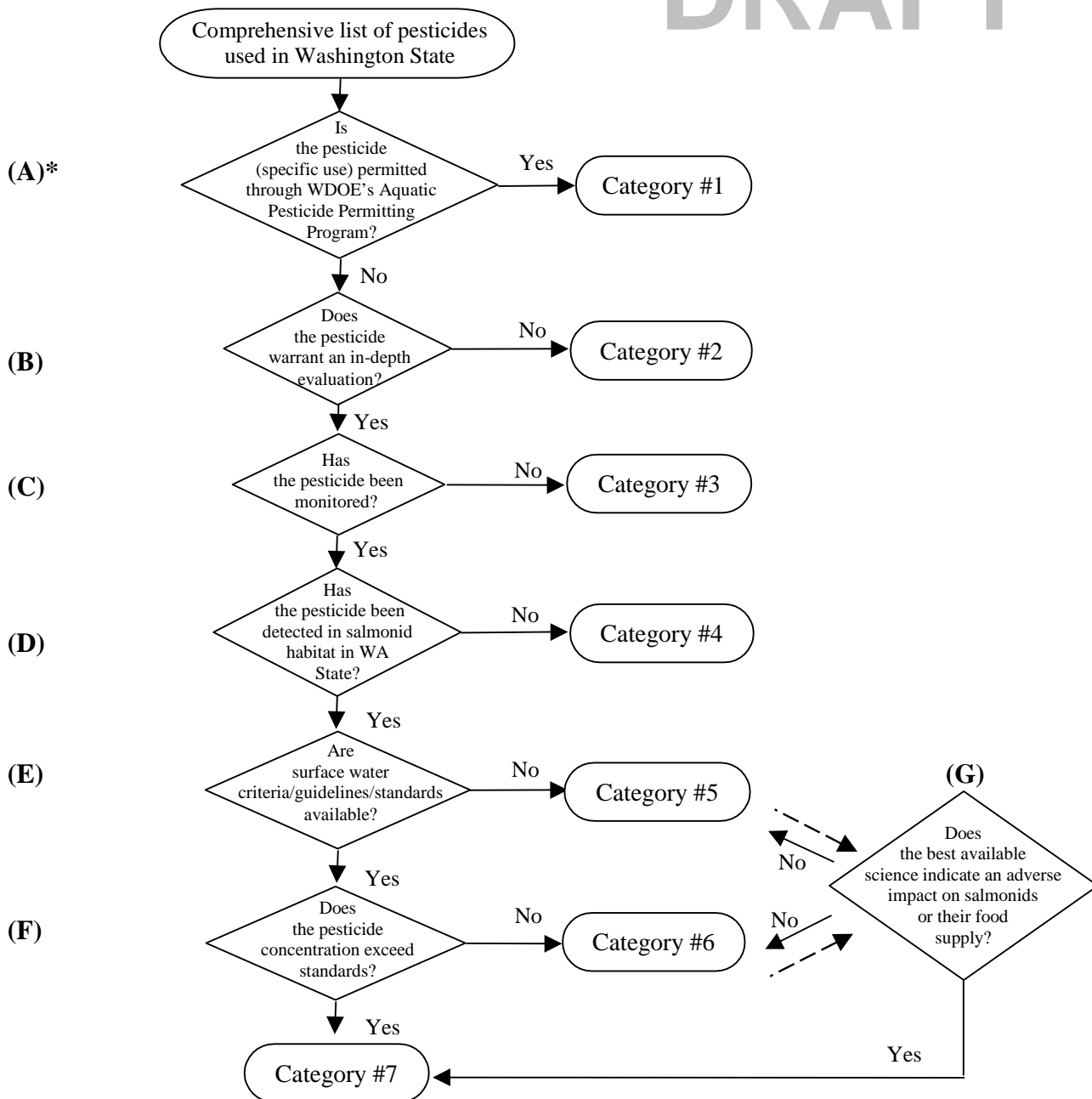
limited to the potential indirect effects of a pesticide on the prey base for salmonids. All other determinations will be based on best available science.

The Task Force recognizes WDOE permits the use of certain pesticides for aquatic weed control, riparian habitat restoration, mosquito control, and other beneficial uses as short-term modifications of the state's surface water quality standards. Environmental Impact Statements (EISs) have generally been adopted for these special programs and, by state law they incorporate Integrated Pest Management (IPM) as the preferred alternative. Moreover, the state's aquatic pesticide use risk assessments specifically consider the potential for effects on the salmonid life cycle and their food chain. For these reasons, the Task Force will evaluate aquatic/special-use chemicals as a separate category (see Category #1 in the matrix below).

Finally, it is important to emphasize that this white paper outlines a decision process that, in the future, the Task Force will use to evaluate the potential impacts of current use pesticides on salmonids. With the exception of a few examples to illustrate how the screening process may work (see below), the Task Force has not begun to apply the matrix to the complete list of chemicals that are currently registered for distribution in Washington State. Also, the Task Force has not determined the exact data standards that will be used at each decision point in the matrix - i.e., what constitutes a significant surface water detection, which aquatic life criteria will be used to identify adverse impacts to listed species, and so on. The Task Force intends to provide an expanded technical analysis for each decision point in the matrix and clear guidance on how the available scientific information will be used to screen pesticides in a future document.

Figure 2. Pesticide Decision Matrix

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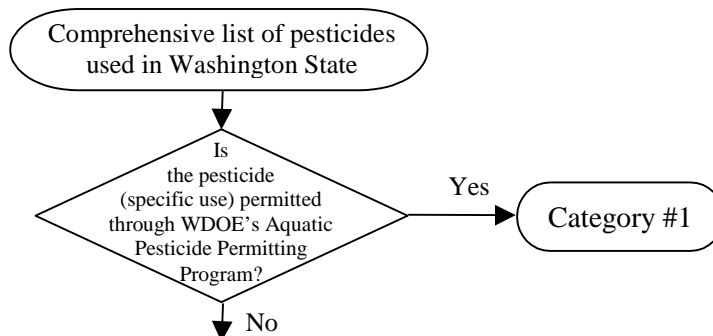
\* Decision points further defined in text to follow

Category	Description
Category #1	Pesticide uses permitted for special/aquatic use by WDOE.
Category #2	Pesticides that do not pose a risk to salmonids and do not warrant further evaluation.
Category #3	Pesticides that are used in proximity to salmonid habitat, but are not included in past or present surface water monitoring studies. - Extent of salmonid exposure uncertain.
Category #4	Pesticides that are used in proximity to salmonid habitat, and are included in surface water monitoring studies, but not detected. - Existing labeling/use restrictions appear adequate to protect listed salmonid species from surface water exposure.
Category #5	Pesticides detected in surface waters, but no criteria/standards/guidelines exist. - Effects on salmonids or their food supply are largely unknown.
Category #6	Pesticides detected in surface waters below established criteria/standards/guidelines. - Indirect effects on food chain unlikely, direct effects on the biological requirements of salmonids largely unknown.
Category #7	Pesticides detected in surface waters above criteria/standards/guidelines. - Adverse impact on salmonid prey species likely, direct effects on the biological requirements of salmonids largely unknown.

## B. Decision Points in the Pesticide Evaluation Matrix & Category Descriptions

The process begins with a compilation of all pesticides registered in Washington State.

### A. *Is the pesticide (specific use) permitted through WDOE's Aquatic Pesticide Permitting Program?*



#### *Rationale:*

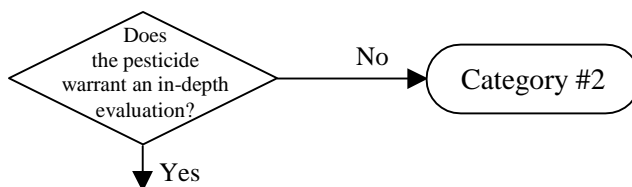
Pesticides that are included in WDOE's aquatic pesticide permitting program have generally been evaluated for their impacts on T/E salmonids through an EIS or similar process. Therefore in the absence of new information, benefits gained by these restoration efforts generally outweigh the risks to salmonids associated with the aquatic/special-use pesticides.

**Category #1** contains aquatic/special-use pesticides that are registered by EPA and WSDA; and the specific uses are permitted by WDOE. The seven areas for which aquatic/special-use pesticides are permitted by WDOE are, to control: (1) aquatic plants and algae, (2) noxious emergent plants, (3) mosquitoes, (4) burrowing ghost shrimp, (5) the elimination of fish in selected waters of the state, (6) maintain free-flow irrigation ditches and (7) gypsy moth (when applications are associated with waterbodies). WDOE requires individuals and entities proposing to use these pesticides to apply for and receive a short-term modification of the State's Surface Water Quality Standards. The modifications, or permits, place restrictions on what chemicals may be used and include timing restrictions and buffer requirements as well as extensive public notification and reporting requirements. Pesticide use and permit conditions must be consistent with the State of Washington's Integrated Pest Management Law (RCW, Chapter 17.15) and either the provisions of an Environmental Impact Statement adopted under the State Environmental Policy Act (RCW, Chapter 43.21C) or the provisions of the Department of Ecology's policy WQP 1-6 and procedure WQP 1-6A on permitting of aquatic pesticides for mosquito control. The EISs include risk assessments for human health and aquatic life and mitigation measures for the various control methods; including biological, physical, mechanical, manual and chemical control. The aquatic life risk assessments for aquatic use pesticides often include seawater challenge tests to assess the impact to juvenile salmonid out migration or smoltification and survival.

The Task Force acknowledges that the use of aquatic pesticides is often necessary to support habitat restoration efforts, protect public health and manage aquatic nuisance species. In fact, the benefits gained by these restoration efforts may in many cases outweigh risks to salmonids associated with the aquatic/special-use pesticides. Upon evaluation, the Task Force has concluded that Washington's Aquatic Pesticide Permitting Program provides an overarching process for detailed evaluation and balancing of the potential risks to salmonids that may be associated with the use of aquatic pesticides and the potential environmental benefits of IPM. Therefore, the Task Force does not find it necessary or advisable to apply additional protections to activities permitted under Washington's Aquatic Pesticide Permitting Program at this time.

The Task Force and the Department of Ecology will continue to share information from monitoring programs, new scientific studies, and assessments of new aquatic pest control methods. If new information becomes available that indicates that the risks of a particular aquatic/special-use pesticide outweighs the benefits, the use of that pesticide would be subject to re-categorization. Lastly, only pesticides used under the Aquatic Pesticide Permitting Program are placed in category 1. All other uses of the same pesticides not permitted through WDOE would still be processed through the decision matrix for categorization.

*B. Does the pesticide warrant an in-depth evaluation?*

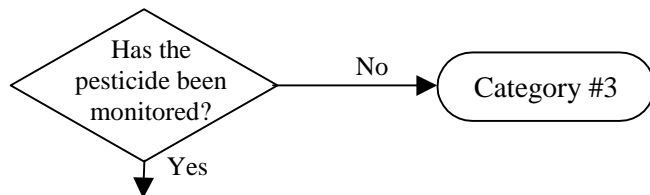


*Rationale:*

The term "pesticide" encompasses a large and diverse group of EPA-registered products. This decision point recognizes that some chemical substances, while technically a pesticide, are very unlikely to adversely affect the biological requirements of salmonids in Washington State. This category includes products such as putrescent whole egg solids that are practically nontoxic to fish. It also includes pesticides that are used so infrequently and in such limited locations that the small amounts applied are not expected to have impacts to salmonids.

**Category #2** contains pesticides that pose little, if any, environmental risks to salmonids. Pesticides would be placed in this category after they are screened. Screening will be based on their usage amounts in the state, basins where the pesticides are applied, frequency of detection in surface water, potential effects to salmonids, and any other relevant characteristics of the pesticide. If information indicates that no deleterious effects would result or would be expected from the use of these compounds, then those pesticides would not warrant an in-depth evaluation.

C. Have surface water monitoring programs in Washington State included the pesticide in their sample analyses?

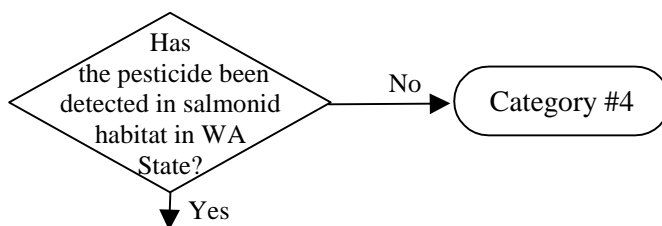


*Rationale:*

The most direct way to determine if salmonids are exposed to pesticides is to measure pesticide concentrations in salmonid-bearing streams, rivers, and estuaries. However, surface water monitoring data for Washington State are incomplete. Of the approximately 750 pesticides (active ingredients) that are currently registered for distribution in the state, only a fraction have been included in surface water monitoring efforts by various agencies. For example, the USGS' NAWQA program, which represent the most intensive sampling efforts in the state, analyze surface waters for a maximum of 128 active ingredients and 57 degradation products. Consequently, in the absence of surface water monitoring data for the majority of pesticides used in Washington State, the extent to which salmonids are exposed to these chemicals is not known.

**Category #3** pesticides are those that are not presently included in Washington State surface water monitoring efforts (e.g., the USGS' NAWQA program). In the absence of monitoring data, the extent to which salmonids are exposed to these pesticides is not known. To the extent possible, the Task Force intends to coordinate with monitoring entities to recommend the addition of pesticides of concern to surface water monitoring efforts.

D. Has the pesticide been detected in surface waters that provide habitat for salmonids in Washington State?

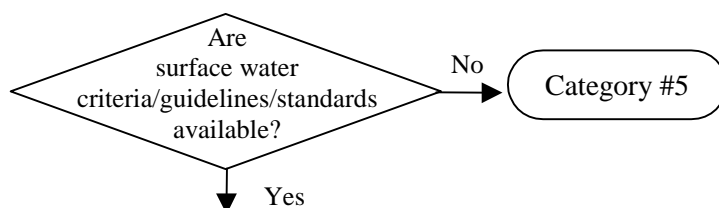


*Rationale:*

For Pacific salmon and steelhead, critical habitat is designated to include all river reaches accessible to listed salmon or steelhead within the range of the ESUs listed, except for reaches on Tribal lands (NOAA, 2000a). Accessible reaches are those within the historical range of the ESUs that can still be occupied by any life stage of salmon or steelhead. For Washington State, designated critical habitat for listed chinook, sockeye, chum, and steelhead have been published in the Federal Register (NOAA, 2000c). Critical habitat for bull trout and coastal cutthroat has not been designated or proposed. Initially, surface water pesticide detections will be considered positive if they fall within the geographical or historical range of salmonids (including bull trout and coastal cutthroat DPSs). Eventually, the SSHIAP informational database will be used to more precisely compare pesticide detections in a river system to the spatial and temporal distribution of T/E salmonids in that habitat.

**Category #4** contains pesticides that are routinely analyzed but have not been detected during various surface water monitoring efforts, namely USGS' NAQWA program. These pesticides, therefore, are defined as those in which the current uses and applications do not appear to result in surface water residues, and thus present no measurable water-borne exposure to listed fish species. Surface water monitoring data suggest that these pesticides are not a limiting factor for salmonid recovery.

*E. Are water quality criteria or standards available for the pesticide?*



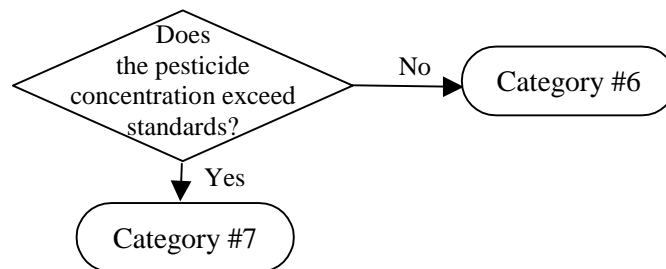
*Rationale:*

Existing water quality criteria, where available, will be used to determine whether pesticides have an indirect effect on salmonids by reducing the abundance of available food. Several agencies and organizations have designed water quality criteria to protect aquatic life from the adverse effects of dissolved pesticides, including the U.S. EPA (1999), the Ministers of Health Canada and Environment Canada (1995), and the International Joint Commission-EPA (1977). In the case of the EPA, water quality criteria serve as scientific guidance to the states to aid in the development of water quality standards under the Clean Water Act. The EPA criteria are not enforceable requirements, but are recommended criteria that states may adopt as part of their legally enforceable water quality standards. Importantly, EPA-recommended criteria are not available for the large majority of current use pesticides, and the criteria that have been developed do not specifically address the biological requirements of anadromous salmonids. Where they exist, however, water quality criteria incorporate the best available science, and they

reasonably predict the negative impacts of pesticides on the plant and animal communities that serve as the basis for the aquatic food chain. By contrast, they do not adequately predict the direct, sublethal effects of pesticides on the health of salmon, trout, and char. For this reason, the use of aquatic life criteria will be limited to the potential indirect effects of pesticides on salmonids via their food supply. Current criteria, standards, guidelines or objectives will be evaluated with specific attention to the biological requirements of T/E salmonids and their prey base using the best available science.

**Category #5** includes pesticides that are detected in surface waters but do not have established water quality criteria/standards/guidelines or objectives. These pesticides, therefore, are defined as those in which the current uses and applications result in residues in surface water, and thus present measurable water-borne exposure to salmonids. It is difficult to assess the impact these pesticides have on a variety of aquatic life forms including salmonids. Since impacts to salmonids from water-borne exposure to these pesticides are largely unknown, the Task Force will review available information (i.e., best available science) in order to assess the direct, indirect and cumulative effects exposure to these compounds may cause, if any. If the best available science predicts an adverse impact on salmonids or their food supply then the pesticide would be re-categorized to Category #7. In the absence of sufficient information to assess the impacts to salmonids, the pesticide would remain in Category #5. If sufficient data are available to predict no adverse impact to salmonids or their prey base, then the pesticide would receive ESA assurances.

*F. Does the pesticide exceed existing criteria or standards for the protection of aquatic life?*



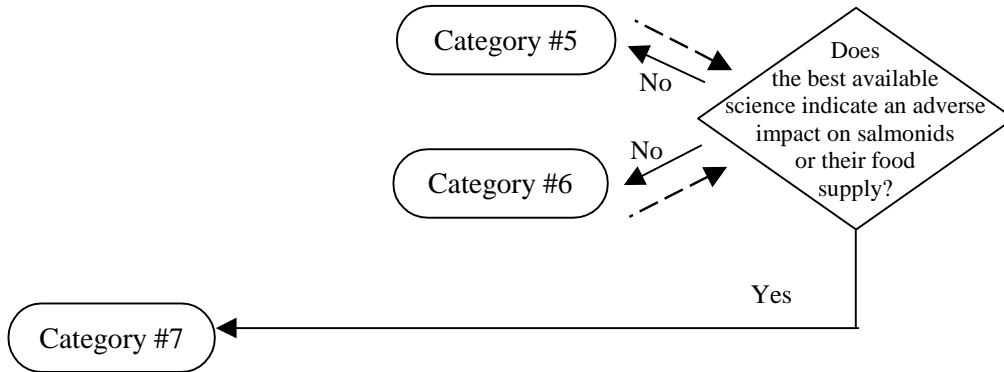
*Rationale:*

The concentrations of pesticides detected in salmonid habitat will be compared to the aquatic life criteria for that chemical. If the pesticide exceeds a level that is considered protective for aquatic ecosystems, it is likely to have negative impacts on the aquatic food chain. If the pesticide does not exceed existing criteria or standards, the potential for direct adverse effects on the physiology or behavior of the animal will be evaluated using the best available science (see decision point G below).

**Category #6** contains pesticides that have been detected in surface waters, but below water quality criteria/standards/guidelines or objectives. These pesticides, therefore, are defined as those in which the current uses and applications result in residues in surface water, and thus present measurable water-borne exposure to salmonids. Since water quality criteria are generally derived to be protective of most, but not all aquatic species, and since the direct, indirect and cumulative effects have not been fully studied for listed salmonids, uncertainty remains regarding these pesticides. The full range of effects to listed fish from water-borne exposure to these pesticides is likely unknown because of a lack of research conducted to evaluate sublethal endpoints. The Task Force will review available information (i.e., best available science) in order to assess the direct and cumulative effects exposure to these compounds may cause, if any. If the best available science predicts an adverse impact on salmonids or their food supply then the pesticide would be re-categorized to Category #7. In the absence of sufficient information to assess the impacts to salmonids, the pesticide would remain in Category #6. If sufficient data are available, and predict no adverse impact to salmonids or their prey base, then the pesticide would receive ESA assurances.

**Category #7** contains pesticides that are detected in surface waters above water quality criteria/standards/guidelines or objectives. These pesticides, therefore, are defined as those in which the current uses and applications result in residues in surface water, and thus present measurable water-borne exposure to salmonids. Since water quality criteria/standards/guidelines or objectives are generally derived to be protective of most, but not all aquatic species, by definition an exceedance of the criteria indicates an impact to some portion of the aquatic community. Although the direct and cumulative effects these compounds exert on the health of salmonids may not be known, the toxicity data suggests that these pesticides may impact the aquatic food chain that salmonids rely on for development and growth. Also, pesticides from other categories (e.g. 5 & 6) may be moved to Category #7 if a review of the best available science indicates an adverse impact on salmonids or their food supply. The Task Force would recommend that formal mitigation measures be implemented on all pesticides that fall within Category #7.

*G. Does the best available science indicate an adverse impact on salmonids or their food supply?*



*Rationale:*

The decision matrix relies on existing water quality criteria to sort pesticides into categories #5 (pesticides detected in salmonid habitat, no criteria available) and category #6 (pesticide detected in salmonid habitat at levels below existing criteria or standards). As discussed above, the use of aquatic life criteria has important limitations. First, salmonids in Washington State are exposed to many pesticides that have no criteria. Second, pesticides may have important sublethal effects on fish at concentrations that fall below guidelines. The ESA requires the use of best available science to determine whether an action that results in the modification of habitat will harm a listed species. Consequently, where a pesticide exposure has been documented for salmonids (i.e., a "yes" to decision point D above), the best available science will be used to determine whether the chemical is likely to have a negative impact on the biological requirements of the animal. If so, the pesticide would be moved to category #7 and the Task Force would recommend that mitigation measures be implemented by WSDA. If the best available science does not predict an adverse effect then the pesticide would receive ESA assurances, however; if there are insufficient data to make a determination, the pesticide would remain in category #5 or #6. The Task Force would not recommend formal mitigation measures for pesticides residing in category #5 and #6, but may instead work with applicators and registrants to implement voluntary measures to reduce exposure, and therefore risk, to salmonids.

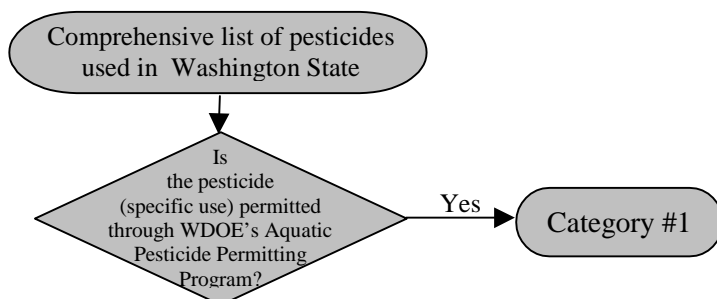
Table 1. Pesticide Category Descriptions

Category	Description
Category #1	Pesticide uses permitted for special/aquatic use by WDOE.
Category #2	Pesticides that do not pose a risk to salmonids and do not warrant further evaluation.
Category #3	Pesticides that are used in proximity to salmonid habitat, but are not included in past or present surface water monitoring studies. - Extent of salmonid exposure uncertain.
Category #4	Pesticides that are used in proximity to salmonid habitat, and are included in surface water monitoring studies but are not detected. - Existing labeling/use restrictions appear adequate to protect listed salmonid species from surface water exposure.
Category #5	Pesticides detected in surface waters, but no criteria/standards/guidelines exist. - Effects on salmonids or their food supply are largely unknown.
Category #6	Pesticides detected in surface waters below established criteria/standards/guidelines - Indirect effects on food chain unlikely, direct effects on the biological requirements of salmonids largely unknown.
Category #7	Pesticides detected in surface waters above criteria/standards/guidelines - Adverse impact on salmonid prey species likely, direct effects on the biological requirements of salmonids largely unknown.

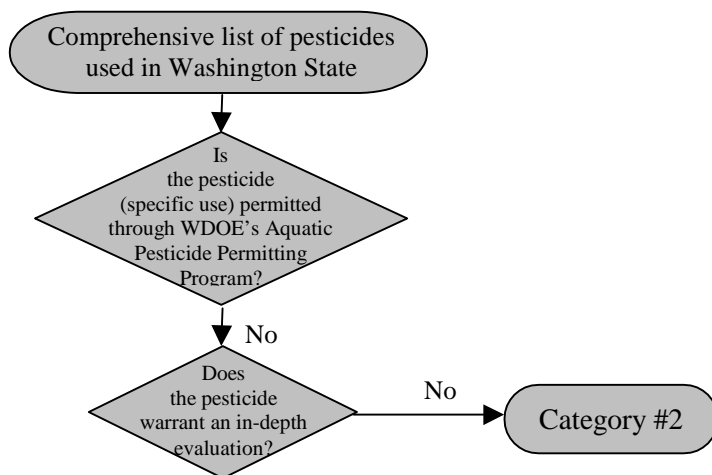
## C. Specific Examples

**Category #1:** An example of a compound that falls into category #1 is the herbicide glyphosate. The formulation Rodeo®, of the active ingredient glyphosate, is used for the control of exotic smooth cordgrass (*Spartina sp.*) on the coastal and estuarine areas of Washington State as described in Washington State's Noxious Emergent Plant Management EIS. The non-native, invasive cordgrass out-competes native vegetation and eliminates important habitat for fish and wildlife. If not controlled, the exotic plant would continue to colonize and degrade physical habitats vital to organisms, including juvenile salmonids. In order to control the spread of *Spartina*, IPM practices are employed and currently focus on mowing the cordgrass as well as aerial and ground applications of Rodeo®. Because the Rodeo® formulation is applied directly in estuarine habitats, one would expect to find high levels that exceed existing standards in the water column following application. Since intertidal estuarine habitats are paramount to the success and survival of many different life stages of organisms, including salmonids, the environmental risks of the herbicide applications are outweighed by the gains in physical habitat that accompany the IPM approach. Thus, this specific use of glyphosate, which is permitted by WDOE, would not require further evaluation and would be placed into category #1. The active ingredient glyphosate has many other applications ranging from home use as the formulation Roundup® to forestry applications of trade names such as Accord® and Ranger®. Since these

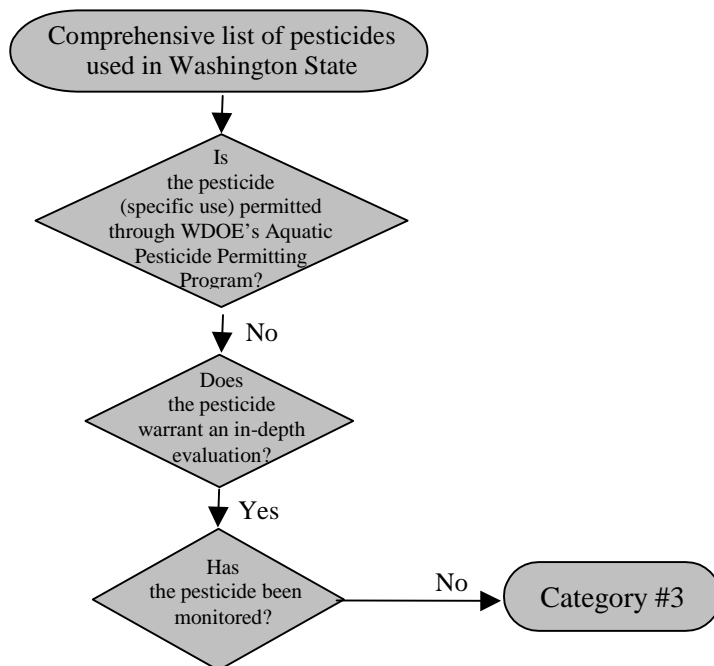
uses do not fall under the definition for category #1 described above, glyphosate applied for these uses would be evaluated through the decision matrix in the same manner as all other registered pesticides in Washington State.



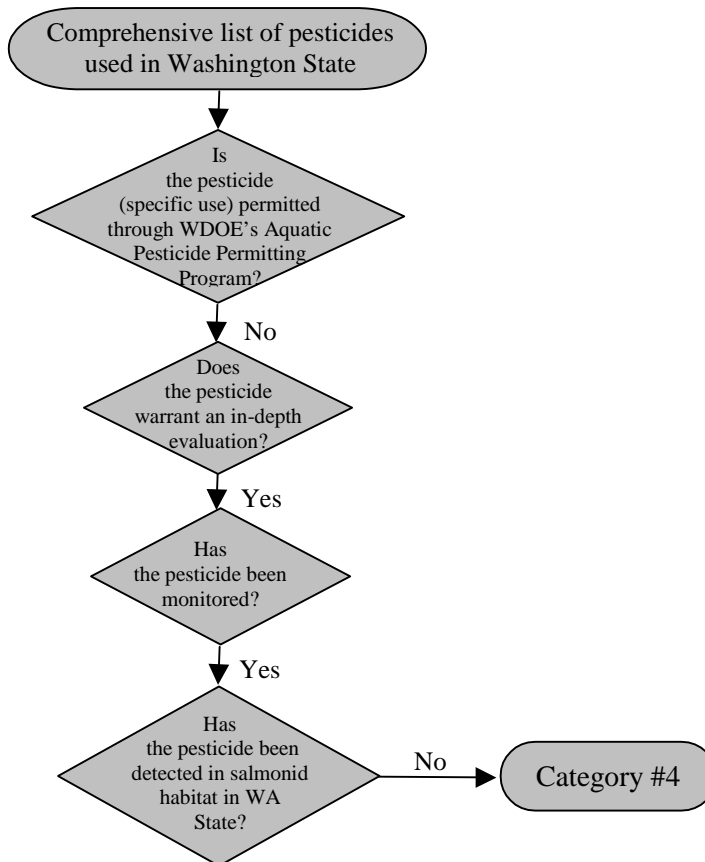
**Category #2:** An example of an active ingredient registered in Washington State that would be placed into category #2 is putrescent whole egg solids. This compound is registered as a deer repellent and while it may be effective for this use, there is little, if any, environmental risk associated with this compound to salmonids. After screening this compound for its potential effects to listed salmonids, no further in-depth evaluation would be warranted and thus this pesticide would be placed into category #2.



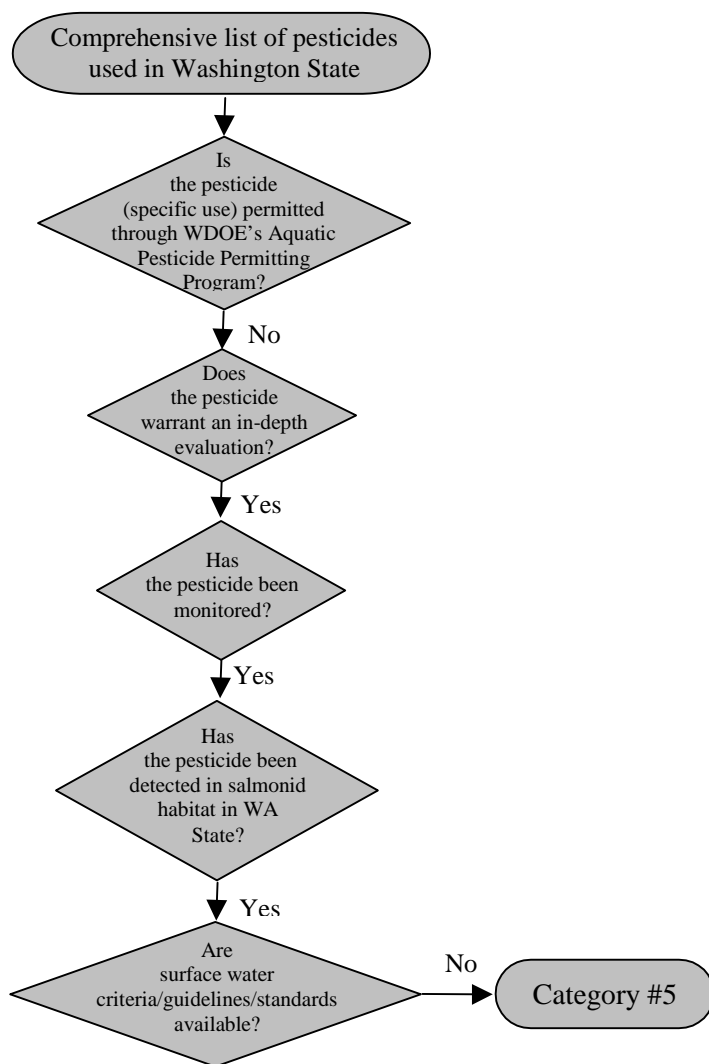
**Category #3** Pesticides allocated to Category #3 are those that are not presently included in Washington State surface water monitoring efforts (e.g., the USGS' NAQWA program). Mancozeb is one example of a fungicide commonly used in Washington State, particularly on potatoes and apples, that is not targeted for analysis during routine monitoring. Under the present matrix mancozeb would be placed into Category #3.



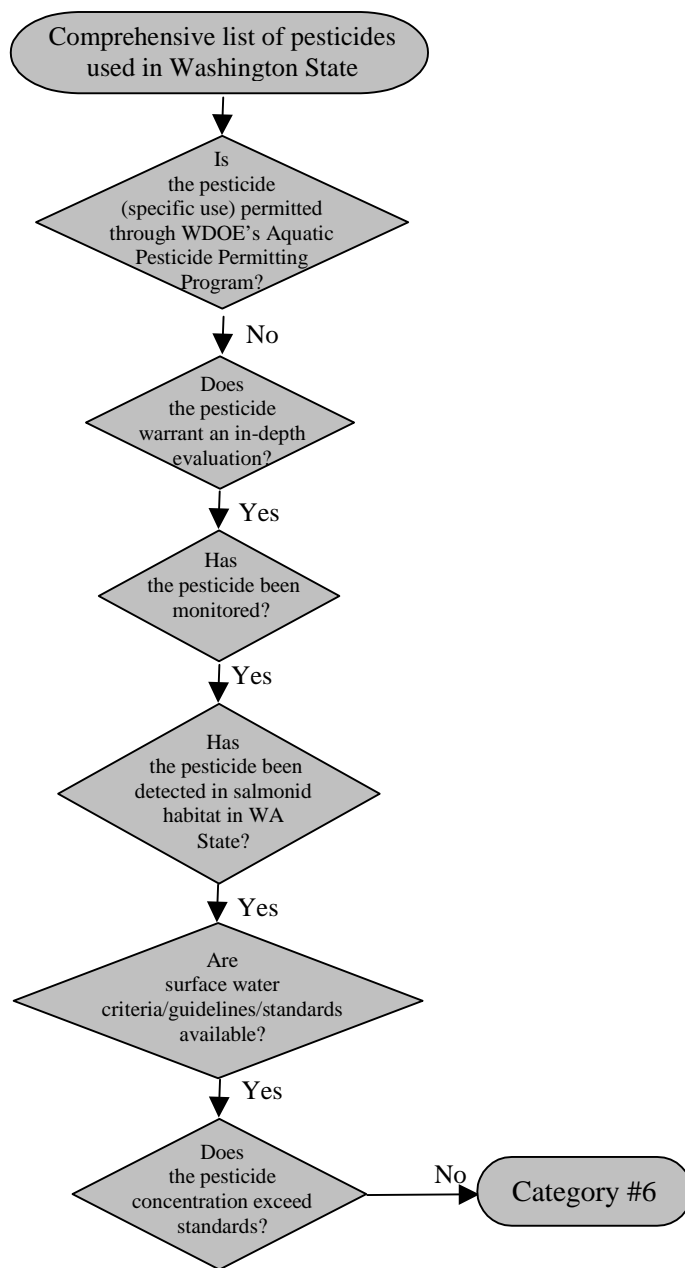
**Category #4:** One example of a Category #4 pesticide is MCPB (methyl chlorophenoxy butyric acid), an herbicide used on peas and clover for post-emergent selective weed control. MCPB is a registered pesticide in Washington State and is included in the present USGS NAWQA analytical schedule. MCPB has not been detected in Washington State surface waters to date, therefore, by definition it is listed as a Category #4 pesticide.



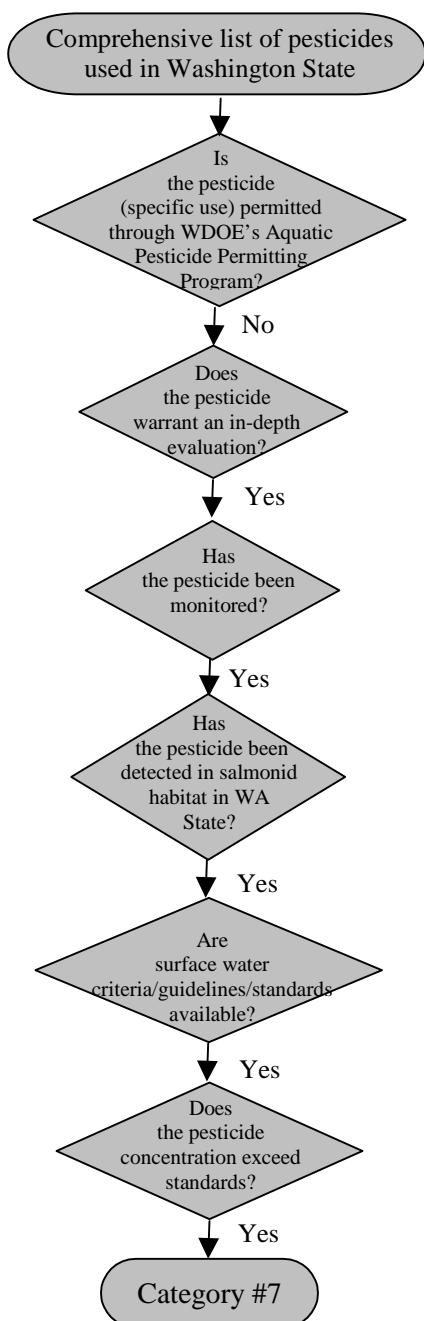
**Category #5:** An example of a Category #5 pesticide is prometon. Prometon is a nonselective triazine herbicide. Prometon is included in the current USGS NAWQA analytical schedule. It has been detected in all three basins presently included in the NAWQA program for Washington State (Bortleson and Davis, 1997, Williamson et al., 1998, and Rinella et al., 1999). Prometon does not have a water quality standard and therefore would be placed into Category #5. Since criteria or standards do not exist for this category, the potential for direct, indirect and cumulative adverse effects on the physiology or behavior of salmonids will be evaluated using the best available science (see decision point G).



**Category #6:** An example of a pesticide that would be placed into Category #6 is atrazine. Atrazine is a selective triazine herbicide that is used predominately on sweet corn and Christmas trees in Washington State. Atrazine is included in the current USGS NAWQA analytical schedule. It has been detected in all three basins presently included in the NAWQA program for Washington (Bortleson and Davis, 1997, Williamson et al., 1998, and Rinella et al., 1999). Concentrations of atrazine detected in Washington State to date have not exceeded water quality standards, and therefore by definition, it would be placed into Category #6. If the pesticide does not exceed existing criteria or standards, the potential for direct adverse effects on the physiology or behavior of the animal will be evaluated using the best available science (see decision point G below).



**Category #7:** Category #7 will include pesticides that are detected in surface waters at concentrations that exceed criteria, standards, or guidelines. Chlorpyrifos is an example of a pesticide that might fall into this category. Chlorpyrifos is an organophosphate insecticide that is the active ingredient in a number of products including Lorsban® and Dursban®. Recently EPA has restricted the use of chlorpyrifos for many household purposes. Chlorpyrifos has been detected in surface waters in Washington State at levels exceeding aquatic life criteria. If the best available science indicates that the established criteria accurately predicts adverse impacts to salmonids or their prey items from an exposure to chlorpyrifos at these concentrations, the pesticide would be placed into Category #7. The Task Force would recommend WSDA implement mitigation measures to reduce and/or eliminate exposure and subsequent risk to listed salmonids and their prey base for pesticides in Category #7.



## D. Fluidity/Best Available Science

The Task Force intends the pesticide screening process to remain fluid. Therefore, if a pesticide is placed in one category it may not necessarily remain there. The Task Force will use the best available science throughout the process ensuring that, as new information becomes available it will be incorporated into the process. The USFWS and NMFS have developed an interagency policy to provide criteria, establish procedures, and provide guidance to ensure that decisions made by the Services under the authority of the ESA, as amended, represent the best scientific and commercial data available (USFWS & NOAA, 1994). New information may provide evidence that a pesticide belongs in a different category than it was initially placed. Given the large information/data gaps that are present, the Task Force will be challenged with the task of evaluating and incorporating new information as it becomes available.

As the Task Force moves to finalize its pesticide strategy and provide certainty (assurances or coverage) to pesticide users through an ESA consultation mechanism, the decision matrix and the categories may need modification to determine those categories which require ESA coverage. The Task Force is presently working to determine the most effective ESA mechanism to utilize (see Appendix C). This mechanism will both provide certainty to pesticide users that when a pesticide is used either as labeled or as defined by state rule that it is consistent with ESA requirements; and to the Services that pesticides used in Washington State are not a limiting factor for salmonid recovery. In response to public comment on the present document and consultation within the Task Force the appropriate ESA mechanism will be chosen and the technical aspects described herein will be altered accordingly.

## E. Data Acquisition & Management

Given the task of identifying pesticides which may impact T/E salmonid recovery in Washington State, the Task Force quickly assessed the information available to make this determination. The logical initial step, assessing pesticide exposure to salmonids, highlighted the need for increased surface water monitoring which reflects the current land use patterns/practices as they relate to salmonid habitat. Using the data available, and potentially new data, the Task Force intends to geographically reference pesticide detections to T/E salmonid habitat. In order to evaluate pesticide presence in habitat important for T/E salmonids, the Task Force has also highlighted the need for a relational database capable of creating overlays of salmonid habitat with pesticide detections generated from a focused monitoring effort.

### (1) Surface Water Monitoring

In general, the USGS' NAWQA program represents the most intensive surface water monitoring effort in the state. The data generated are part of a nationwide assessment of the water quality in

urban and agricultural basins in the United States. The data have undergone strict QA/QC and statistical analyses, and represent an accurate snapshot of pesticides in surface waters. While the data presently available are high quality and GIS-coordinated, they lack salmonid-specific spatial and temporal components that are important to the process (i.e., decision matrix). Additionally, the NAWQA sampling sites do not represent many of the combinations of land uses and fish habitats of interest in Washington State. Also, the NAWQA program is not designed to be ongoing in all basins; rather each basin is typically revisited each decade to assess water quality changes. The earlier NAWQA data sets do not include the entire suite of pesticides currently being analyzed. To assess pesticide usage that may impact T/E salmonids, the Task Force needs key watershed data representative of both specific agricultural use patterns and urban-specific pesticide use patterns.

To address the information gap in surface water monitoring, Washington State, with the support of the Task Force, is presently attempting to obtain federal funding for USGS to begin a new, expanded USGS-Washington State Surface Water Monitoring Program. This focused program, if funded, will provide a more detailed, ongoing monitoring program for pesticides in Washington State surface waters. The Task Force has proposed the following five Water Resource Inventory Assessment (WRIA) units or basins for the monitoring program: the Lower Skagit, Lower Yakima, Lower Crab Creek and Walla Walla for the agricultural basins and the Cedar-Sammamish as the urban basin. These basins represent the various cropping patterns in Washington State and a predominately urban basin. Sampling would occur in sub-basins or lower reaches within these WRIA units to meet the goals of the program. By increasing the existing monitoring it is possible to identify the temporal and spatial distribution of pesticides in Washington's surface waters. The Task Force will also be able to address pesticides that are of interest in Washington that may not be of broad interest nationwide.

## **(2) Relational Database**

A critical step regarding data management is the establishment of a relational database that links patterns of pesticide application and detection with salmonid presence and habitat. The database will include statewide pesticide use data (where available), data from previous and ongoing pesticide surface water monitoring studies, critical habitat designations, and habitat utilization data for listed fish species. This database will be essential for analyzing the diversity and distribution of pesticides in surface waters and the potential for exposure to salmonids and their habitat in Washington State. With the decision matrix incorporated into the database, the Task Force will be able to address the following important management questions with a high degree of certainty:

- Which pesticides have been detected in habitat currently or historically utilized by salmonids, and at what concentrations?
- Do pesticides reach levels high enough to cause indirect (loss of food base) or direct (sublethal toxicity) adverse effects to salmonids?

- Can mitigation measures, including Best Management Practices (BMPs), be used to limit pesticide transport to surface waters, thereby eliminating the risk that these chemicals pose for salmonids?

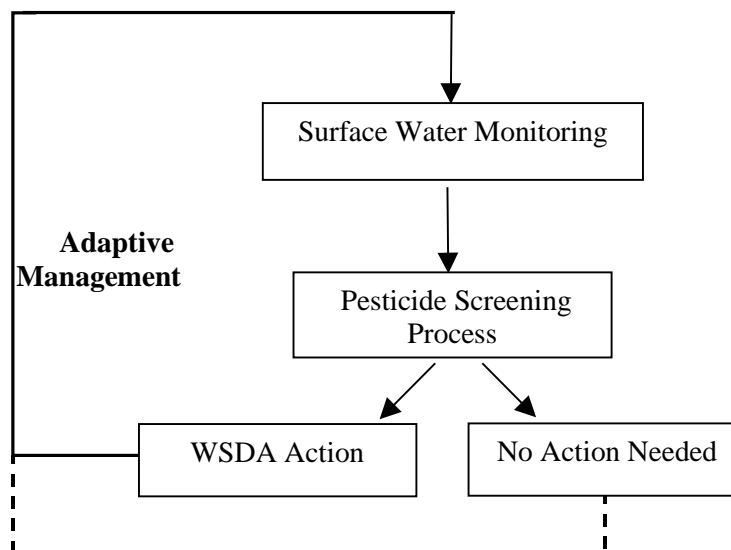
The database will consist of spatially-based pesticide detections as well as species and/or habitat data sets, which include point location surface water data linked to a GIS. The platform for the pesticide database is currently under consideration however, regardless of the platform the Salmon and Steelhead Habitat Inventory and Assessment Program (SSHIAP) will be used as the basis for identifying fish presence and population status. SSHIAP is the most current and comprehensive database of salmonid presence and habitat locations in Washington State.

## IV. Program Elements

The proposed Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids contains the following key elements:

- Surface Water Monitoring
- Pesticide Screening Process - Decision Matrix
- WSDA Action
- Adaptive Management

Figure 3. Program Elements



## A. Surface Water Monitoring

A critical part in identifying pesticide exposure to T/E salmonids is having high quality, GIS-coordinated monitoring data of representative watersheds in Washington State. Initially the Task Force will use all available high quality data to assess exposure, but with the limitations mentioned above, the need for additional monitoring data is integral to the success of this program. The Task Force is hopeful that funding will be obtained to enhance pesticide surface water monitoring in Washington State. The Task Force believes that this information will provide a more accurate assessment of pesticides in surface waters, which will provide the regulatory community with better information upon which to make decisions.

## B. Pesticide Screening Process

The process, i.e., the decision matrix, was designed to identify those pesticides which may impact T/E salmonids. The matrix presently incorporates surface water exposure data and the best available science to assess the potential for adverse effects on salmonids.

In terms of a pesticide's potential impact on aquatic life, the Task Force will rely on the available scientific literature. However, there are presently major gaps in our scientific understanding of how pesticides interact with the biology of migratory salmonids. This uncertainty falls into two categories. First, there is little data that documents the effects of the 750 pesticide active ingredients registered in Washington on aquatic ecosystems and the specific invertebrate prey of T/E salmonids. Second, the scientific studies that have been conducted on fish are largely limited to measures of acute mortality - i.e., the concentrations at which short-term exposures to a pesticide will kill fish outright ( $LC_{50}$ ). In many cases, acute mortality data may not be appropriate for estimating whether a pesticide will have adverse, non-lethal effects on the essential behavior patterns of salmonids (e.g., feeding, spawning, or migration).

The Task Force recognizes a general need for new scientific research that specifically addresses the potential impacts of pesticides on salmonids in Washington State. This research should focus on the direct, sublethal effects of chemicals on salmonid essential behaviors as well as the effects of pesticides on the abundance of invertebrate prey species in salmonid habitat. It is expected that academic institutions, registrants, local governments, state agencies, and federal research laboratories will participate in this effort. The Task Force will incorporate new scientific information into the pesticide evaluation process (the matrix) as it becomes available.

## C. WSDA Action

WSDA has broad statutory authority to act on pesticides. WSDA is the state lead regulatory agency for pesticides, registering all pesticides distributed in Washington State (RCW 15.58.050). Based on the determined impact of a pesticide on T/E salmonid species, the agency could restrict, condition or prohibit the use of a pesticide in specific areas or statewide by rule. Restrictions may range from timing of application to type of application equipment allowed. The agency also has the authority in RCW 17.21 to license pesticide applicators and/or require licensing for specific types of applications. For violations of either Chapter 17.21 RCW or Chapter 15.58 RCW, the agency has a range of penalties provided in rule ranging from notices of correction to civil penalties of up to \$7500 per violation and suspension, revocation, or denial of pesticide applicator's or dealer's licenses.

Once WSDA receives a recommendation from the Task Force that a pesticide may impact T/E salmonids, it will initiate a process to review the Task Force's recommendation. WSDA will identify the crop(s) the pesticide is used on, the method and timing of its application, the physical parameters of the environment where it is used, etc. WSDA will then design a mitigation plan to reduce transport of that pesticide to surface water or to otherwise reduce impacts to listed species. The mitigation plans may include a wide range of responses, from educational to regulatory. The key to the success of the effort is the ability for WSDA to react relatively quickly rather than having to wait for the much slower federal process of changing the pesticide label. Additionally, the federal label typically does not address state-specific issues; therefore action by the state is the preferred and customary alternative.

WSDA's involvement in this process is twofold: (1) to provide certainty to growers and other pesticide users, that if a pesticide is identified as a potential problem for T/E salmonids, WSDA will work with the regulated community to affect changes which will mitigate pesticide exposure to salmonids; and (2) to work with the agencies overseeing the recovery of T/E salmonids to ensure that pesticide use is not a limiting factor for salmonid recovery. WSDA believes that involvement in this process provides a direct avenue for WSDA input on ESA/FIFRA/CWA issues that may impact Washington agriculture.

## D. Adaptive Management

Success of the proposed program includes an overall adaptive management approach to ensure that mitigation measures are providing the expected benefits. The expanded monitoring program is integral to the success of this approach, because it provides the relevant data needed to determine if mitigation measures are working. With this approach, data collected in the future will either validate that actions taken are having the desired effect (i.e., reducing or eliminating pesticide exposure, and therefore risk, to salmonids) in the watersheds, or indicate that additional actions are needed. The Task Force encourages the users and/or registrants of pesticides detected in surface water to enact voluntary BMPs, educational programs or other mechanisms to inhibit pesticide transport to surface waters in the future. By reducing pesticide transport to surface

waters, exposure and subsequent risk to salmonids, as well as other biological receptors from pesticides, is mitigated. The Task Force has expressed its commitment to retain the fluidity this type of program needs to be successful. Using an adaptive management approach ensures this goal is achieved.

## V. Uncertainties

At present uncertainties exist around mixtures, adjuvants (surfactants, etc.), formulations, degradates and new products. Mixtures present the most significant uncertainty, as the data suggest that salmonids are exposed to mixtures of pesticides rather than individual compounds. The Task Force is aware of research presently underway that may help elucidate the effect that these combinations of pesticides may have on salmonids. The Task Force intends to incorporate this, and other new information, as it becomes available. Adjuvants, or products added to pesticide tank mixes to aid in the physical dispersal or adherence of the pesticide, also introduce a level of uncertainty.

Laboratory uncertainties also exist. For example, if a pesticide was not detected why was it absent? Was it because it truly was not there or was the detection limit too high? Additional uncertainties exist around sampling, including timing of sampling, pulses of chemicals, storm events, etc. It is important to note that current surface water monitoring efforts are not usually linked to actual use or applications of pesticides and therefore, typically reflect ambient water quality conditions, not necessarily the maximum concentrations that may be associated with post-application conditions. Also, this document presents a process for evaluating pesticide exposure through the surface water pathway only. However, the Task Force recognizes that other exposure pathways (i.e., ground water, sediment and dietary) may also be important.

Another level of uncertainty arises from changes in pesticide use as a result of registration restrictions/cancellations. The recent regulatory changes around the use of azinphos-methyl, chlorpyrifos and diazinon highlight this issue. Close coordination with EPA/OPP (Office of Pesticide Programs) will allow for communication on such changes.

The Task Force recognizes that these issues are relevant to assessing pesticide exposure and subsequent effects to T/E salmonids, and intends to incorporate new information to address these issues as it becomes available. However, at present it will address those pesticides that are present in salmonid habitat in Washington State surface waters that may present a limiting factor for T/E salmonid recovery.

## VI. Conclusion

The Washington State Pesticide/ESA Task Force is a collaborative effort involving federal and state natural resource and regulatory agencies. Collectively, these agencies oversee various aspects of pesticide registration and use, water quality in the state's river systems and estuaries, and the health and viability of wild salmonids. The agencies also have a shared goal in ensuring that pesticides do not adversely impact the biological requirements of salmonids, and thereby limit the recovery of ESA-listed populations. The principal aim of the Task Force is to provide the agencies with science-based guidance on the exposure to and potential toxicity of pesticides to salmonids and aquatic ecosystems in Washington State.

This White Paper describes a framework that the Task Force will use to evaluate current use pesticides in the context of T/E salmonids. The process considers pesticide use data, species distributions, surface water monitoring information, and scientific studies that address the toxicological effects of pesticides on fish and the aquatic food chain. The decision matrix is also designed to incorporate new scientific information as it becomes available.

The decision matrix, as outlined here, does not include a complete technical description of each decision point in the pesticide evaluation process. Several decision criteria have yet to be clarified. For example, for each pesticide, what constitutes a significant application, or a significant surface water detection? Which aquatic life criteria or standards should be used, and in what order? Which scientific studies should be used to estimate whether a pesticide has an adverse impact on salmonids or their food supply? The Task Force intends to solicit public comment on these decision points in the form of public review of an expanded technical document where they will be presented. The Task Force will subsequently use the decision matrix to screen pesticides that are currently registered for distribution in Washington State.

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## Appendix A: Current Contacts

### Policy Team:

Jim Jesernig  
 Director of the Washington  
 State Department of Agriculture  
 WSDA  
 P.O. Box 42560  
 Olympia, WA 98504  
 (360) 902-1887  
[JJesernig@agr.wa.gov](mailto:JJesernig@agr.wa.gov)

Lee Faulconer  
 Policy Assistant to the Director  
 WSDA  
 P.O. Box 42560  
 Olympia, WA 98504  
 (360) 902-1804  
[LFaulconer@agr.wa.gov](mailto:LFaulconer@agr.wa.gov)

Steve Saunders  
 Manager, Environmental Quality  
 & Compliance Division  
 WDNR  
 P.O. Box 47015  
 Olympia, WA 98504  
 (360) 902-1488  
[stephen.saunders@wadnr.gov](mailto:stephen.saunders@wadnr.gov)

Dick Wallace  
 Senior Policy Analyst,  
 Water Quality Program  
 WDOE  
 P.O. Box 47600  
 Olympia, WA 98502  
 (360) 407-6489  
[dwal461@ECY.WA.GOV](mailto:dwal461@ECY.WA.GOV)

Steven Landino  
 Washington State Habitat Branch Chief  
 NMFS  
 510 Desmond Dr. SE, Suite 103  
 Lacey, WA 98503  
 (360) 753-6054  
[Steven.Landino@noaa.gov](mailto:Steven.Landino@noaa.gov)

Bob Arrington  
 Assistant Director, Pesticide  
 Management Division  
 WSDA  
 P.O. Box 42589  
 Olympia, WA 98504  
 (360) 902-2011  
[BArrington@agr.wa.gov](mailto:BArrington@agr.wa.gov)

Linda Crerar  
 Policy Assistant to the Director  
 WSDA  
 P.O. Box 42560  
 Olympia, WA 98504  
 (360) 902-1818  
[LCrerar@agr.wa.gov](mailto:LCrerar@agr.wa.gov)

John Mankowski  
 Special Assistant to the Director  
 WDFW  
 600 Capitol Way N  
 Olympia, WA 98501  
 (360) 902-2589  
[mankojdm@dfw.wa.gov](mailto:mankojdm@dfw.wa.gov)

Carol Schuler  
 Acting Manager, Western  
 Washington Office  
 USFWS  
 510 Desmond Dr. SE, #102  
 Lacey, WA 98503  
 (360) 753-4065  
[carol\\_schuler@fws.gov](mailto:carol_schuler@fws.gov)

Richard Parkin  
 Columbia River TMDL Coordinator  
 EPA – Region 10  
 1200 – 6<sup>th</sup> Avenue  
 Seattle, WA 98101  
 (206) 553-8574  
[parkin.richard@epa.gov](mailto:parkin.richard@epa.gov)

**Technical Team:**

Bridget Moran  
Endangered Species Coordinator/  
Environmental Toxicologist  
WSDA  
P.O. Box 42589  
Olympia, WA 98504  
(360) 902-1936  
[BMoran@agr.wa.gov](mailto:BMoran@agr.wa.gov)

Steve Saunders  
Manager, Environmental Quality  
& Compliance Division  
WDNR  
P.O. Box 47015  
Olympia, WA 98504  
(360) 902-1488  
[stephen.saunders@wadnr.gov](mailto:stephen.saunders@wadnr.gov)

Allen Moore  
Lake & Aquatic Pesticide Program  
Specialist, Water Quality Program  
WDOE  
P.O. Box 47600  
Olympia, WA 98502  
(360) 407-6563  
[amoo461@ECY.WA.GOV](mailto:amoo461@ECY.WA.GOV)

Andrea LaTier  
Fish & Wildlife Biologist/Toxicologist  
USFWS  
510 Desmond Dr. SE, Suite 102  
Lacey, WA 98503  
(360) 753-9593  
[andrea\\_latier@fws.gov](mailto:andrea_latier@fws.gov)

Nathaniel Scholz  
Research Zoologist  
NMFS/NWFSC  
2725 Montlake Blvd. E  
Seattle, WA 98112  
(206) 860-3454  
[nathaniel.scholz@noaa.gov](mailto:nathaniel.scholz@noaa.gov)

Ted Maxwell  
Registration Program Manager  
WSDA  
P.O. Box 42589  
Olympia, WA 98504  
(360) 902-2026  
[TMaxwell@agr.wa.gov](mailto:TMaxwell@agr.wa.gov)

Carl Samuelson  
Policy Assistant/  
Water and Habitat  
WDFW  
600 Capitol Way N.  
Olympia, WA 98501  
(360) 902-2563  
[samueces@dfw.wa.gov](mailto:samueces@dfw.wa.gov)

Denise Baker  
Acting Manager, Division of  
Environmental Contaminants  
USFWS  
510 Desmond Dr. SE, #102  
Lacey, WA 98503  
(360) 753-5821  
[denise\\_baker@fws.gov](mailto:denise_baker@fws.gov)

Jay Davis  
Environmental Toxicologist  
USFWS  
510 Desmond Dr. SE, #102  
Lacey, WA 98503  
(360) 753-9568  
[jay\\_davis@fws.gov](mailto:jay_davis@fws.gov)

Lyn Frandsen  
Pesticide Enforcement/Compliance  
EPA – Region 10/ECO-084  
1200 – 6<sup>th</sup> Ave.  
Seattle, WA 98101  
(206) 553-4768  
[frandsen.lyn@epa.gov](mailto:frandsen.lyn@epa.gov)

**Scientific Advisory Team:**

Sandra Embrey  
Hydrologist, Puget Sound Basin Study Unit  
USGS  
1201 Pacific Ave., Suite 600  
Tacoma, WA 98402  
(253) 428-3600 Ext. 2644  
[ssembrey@usgs.gov](mailto:ssembrey@usgs.gov)

Jim Ebbert  
Hydrologist (retired)  
USGS  
1201 Pacific Ave., Suite 600  
Tacoma, WA 98402  
(253) 428-3600 Ext. 2682  
[jcebbert@usgs.gov](mailto:jcebbert@usgs.gov)

John Stark  
Professor, Environmental Toxicologist  
WSU  
7612 Pioneer Way East  
Puyallup, WA 98371  
(253) 445-4519  
[stark@puyallup.wsu.edu](mailto:stark@puyallup.wsu.edu)

## Appendix B: Policy Statement

### National Coordination

This white paper describes a process for addressing pesticide issues relative to threatened and endangered salmonids. It has been developed by the State of Washington and the regional office of the Environmental Protection Agency in Seattle, Washington, the Western Washington Office of the U.S. Fish and Wildlife Service in Lacey, Washington and the Washington State Offices of the National Marine Fisheries Service. Because this proposal was developed at the regional level it is important that it be recognized by, and coordinated with, the headquarters offices of the federal agencies.

On September 21, 2000 a meeting was held in Olympia, Washington to present the proposal to representatives of the Washington DC offices of the federal agencies and solicit their support and endorsement prior to moving forward. The outcome of this meeting was support for the process from headquarters staff, subject to review of the completed white paper. Several agreements and commitments were made by the federal agencies on September 21. They are listed below.

- ◆ Each federal agency designated a staff person from their regional or state office and headquarters offices to form an "oversight group" to work with the state process.
- ◆ The Services agreed to provide science and research support, as negotiated, recognizing resource constraints.
- ◆ EPA Office of Pesticide Programs agreed to assist the technical team to the best of their ability, recognizing their resource limitations.
- ◆ The services agreed to address the ESA certainty issues with the state.
- ◆ The National Marine Fisheries Service agreed to internally discuss and resolve the issue of who and how to consult with EPA.
- ◆ It was reiterated that EPA had already designated Washington State as a non-federal representative.
- ◆ State and Federal Agencies agreed to work together to secure funding necessary to expand the current U.S. Geological Survey NAWQA program to sample for pesticides of concern in selected watersheds.
- ◆ State and Federal Agencies agreed to work together to secure funding necessary to establish or modify existing data management systems to handle data relative to pesticide use in Washington State, pesticide sampling data and threatened and endangered fish habitat information.

## Appendix C: Endangered Species Act Application

Endangered Species Act and its application to the *Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids*

This appendix describes how the *process* may interact with the Endangered Species Act (ESA) to ensure that salmonid species are protected, as well as to identify how entities could receive ESA “coverage”.

### Objectives:

1. Create/maintain incentives for the State of Washington, other western states, and pesticide users to evaluate pesticides to ensure they are not a limiting factor for the recovery of ESA-listed salmonids.
2. Design a process that may complement EPA’s national Section 7 consultation.  
*There is a National 7(a)1 Proactive Conservation Review currently under way regarding the pesticide registration and re-registration process.*
3. Provide ESA limitations on take liability for the State of Washington and pesticide users for those pesticides in certain categories, and for those pesticides potentially regulated by the state more stringently than EPA’s label requires.
4. Maintain a collaborative process that is science driven with policy support.
5. As quickly as possible, absolve non-limiting factor pesticides, mitigate potentially problematic pesticides and resolve uncertainty.

### Alternatives evaluated:

The ESA provides three mechanisms to grant incidental take and provide ESA assurances: section 4(d), section 7, and section 10. In both sections 7 and 10, incidental take would be authorized and permitted. Through the section 7 mechanism, the Services would evaluate the measures that evolve from this *process* in a biological opinion, and allow incidental take through an incidental take statement included in the opinion. Section 7 would require a nexus through which implementation of the measures by the State and pesticide users would become a federal action. In the section 10 mechanisms, the Services would evaluate a Habitat Conservation Plan (HCP) developed by some organization, agency, or individual, and issue an incidental take permit to that party. The permit holder would be responsible for ensuring that the measures evolved from this *process* were implemented. Since the HCP creates legally-binding obligations, both the permit holder and the Services would forgo some of their ability to modify or rescind its terms. Through section 4(d), the Services would modify rules that prohibit incidental take and

actually declare that pesticide use in accord with the measures that evolve from this *process* would not be a prohibited activity; it would be an exemption or limit to the prohibitions. As with an HCP, some nonfederal entity would need to be responsible for ensuring that the measures were implemented.

In all three mechanisms, both the entity responsible for implementing the measures and the individuals that acted in accord with those measures, would be in compliance with the ESA. However, given the uncertainties with a clear federal nexus or an individual permit holder, it appears that section 4(d) would provide the greatest opportunity for granting ESA assurances.

Section 4(d) states in part “Whenever any species is listed as a threatened species...the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species.” The 4(d) rule [50 CFR part 223; FR vol. 65, No. 132, July 10, 2000) issued by the National Marine Fisheries Service (NMFS) notes that EPA has not completed consultation under Section 7 of ESA, and further notes that “...if NMFS finds that a limitation on the prohibition against take for the use of selected pesticides is necessary and advisable for the conservation of listed salmonids, it may amend this rule accordingly.” (FR 42457)

Thus, the State of Washington White Paper describes a *process* for evaluating pesticides that, when approved and implemented, would provide a mechanism that will lead to compliance under the ESA. Application of a 4(d) rule as the mechanism for providing this coverage would benefit pesticide applicators in the form of limitations on the prohibitions against take through compliance with the 4(d) rule for the pesticide *process*. Implicit to providing a take limitation is the establishment of a mechanism to track the review process for each chemical, and ground-truth (i.e., monitor) the effectiveness of the pesticide evaluations as well as the mitigation measures implemented. This is necessary to provide the Services with assurances that exposure of salmonids to pesticides is minimized, thereby reducing the potential for adverse effects. By approving the process and participating in its implementation, the Services can with some degree of confidence provide a take limitation for specific categories of pesticides; assuring that the pesticide applicators are in compliance with ESA and reducing the potential for violations of section 9 of the ESA. Therefore, an ESA section 4(d) rule or amendment may be one appropriate vehicle to acknowledge the State’s pesticide review process.

## Appendix D: Signature Page

This paper was developed by the Washington State Pesticide/ESA Task Force whose members are listed below. The Task Force is committed to beginning the process described, to more effectively and cooperatively protect threatened and endangered salmonids.

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Washington State Department of Agriculture

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Date

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National Marine Fisheries Service - Northwest Region

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Date

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U.S. Fish & Wildlife Service - Western Washington Office

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Date

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U.S. Environmental Protection Agency - Region 10

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Date

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Washington State Department of Ecology

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Date

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Washington State Department of Natural Resources

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Date

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Washington State Department of Fish & Wildlife

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Date